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$|\sigma_1| \geqslant k$ $M(\alpha)$ is the plane $\tau = \alpha k$ for $\sigma_1 < -k$ and $\tau = -\alpha k$ for $\sigma_1 > k$. Let $|\alpha|$ be chosen so small that the roots of the polynomial $P(s_1, \sigma_2)$ for which Im s_1 has different signs, lie at different sides of $M(\alpha)$. Let M_1 be the set $M(\alpha)$ for the chosen α, if $\alpha > 0$, and M_2 be the corresponding set, if $\alpha < 0$.

Theorem 1: The integrals

$$E_i(x,y) = \iint_{H_i} \frac{e^{ixs_1+iys_2}}{P(s_1, s_2)}\, dH_i = \iint_{H_i} \frac{e^{ixs_1+iys_2}}{s_1^{2n} + s_2^{2n} - k^{2n}}\, dH_i, \quad i=1,2, \tag{4}$$

exist and give two fundamental solutions for (2).

Theorem 2: The fundamental solutions

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$$E_{\varepsilon}(x,y) = \iint\limits_{-\infty}^{\infty} \frac{e^{ixs_1+iys_2}}{P(\sigma_1, \sigma_2) + i\varepsilon}\, d\sigma_1\, d\sigma_2 \qquad (6)$$

for the operators

$$P_{\varepsilon}\left(i\frac{\partial}{\partial x}, i\frac{\partial}{\partial y}\right) = P\left(i\frac{\partial}{\partial x}, i\frac{\partial}{\partial y}\right) + i\varepsilon \qquad (5)$$

converge to $E_1(x,y)$ for $\varepsilon \to -0$, and to $E_2(x,y)$ for $\varepsilon \to +0$.

It is put $\theta_1 = \cos\left(\mathrm{arc\,tg}\,\frac{y}{x}\right)$, $\theta_2 = \sin\left(\mathrm{arc\,tg}\,\frac{y}{x}\right)$,

Theorem 3: For all γ from the given interval there holds

$$\frac{\partial^{p+l} E_1(x,y)}{\partial x^p \partial y^l} =$$

$$= C_k (ik)^{p+l} \frac{\exp\left[ik\left(\theta_1^{\frac{2n}{2n-1}} + \theta_2^{\frac{2n}{2n-1}}\right)^{\frac{2n-1}{2n}} r\right]}{\sqrt{r}} \frac{\left(\theta_1^{\frac{2n}{2n-1}} + \theta_2^{\frac{2n}{2n-1}}\right)^{\frac{2n-3-2(p+l)}{4n}}}{\theta_1^{\frac{n-1-p}{2n-1}}\, \theta_2^{\frac{n-1-l}{2n-1}}} + w_{pl}, \qquad (7)$$

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where

$$\left|w_{pl}\right| < \frac{c\left|\theta_1\right|^{\frac{p+1}{2n-1}}\left|\theta_2\right|^{\frac{l+1}{2n-1}}}{\left(r\left|\theta_1\theta_2\right|^{\frac{2n}{2n-1}}\right)^{\gamma}}, \quad 1 > \gamma \geqslant \frac{1}{2} \tag{8}$$

From the formulas (7) and (8) the following conditions for the existence and for the uniqueness of the solution of (2) are obtained:

Theorem 4: It is $u \subset W$, if

$$1) \quad |u| < \frac{c}{r^{1/2}\left|\theta_1\theta_2\right|^{\frac{n-1}{2n-1}}}; \tag{9}$$

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2) $$\left|\frac{\partial^p u}{\partial x^p} - \varkappa_1 \frac{\partial^{p-1} u}{\partial x^{p-1}}\right| < \frac{c\,|\theta_1\theta_2|^{\frac{1}{2n-1}}}{\left(r\,|\theta_1\theta_2|^{\frac{2n}{2n-1}}\right)^{\lambda}} ; \qquad (10)$$

3) $$\left|\frac{\partial^p u}{\partial y^p} - \varkappa_2 \frac{\partial^{p-1} u}{\partial y^{p-1}}\right| < \frac{c\,|\theta_1\theta_2|^{\frac{1}{2n-1}}}{\left(r\,|\theta_1\theta_2|^{\frac{2n}{2n-1}}\right)^{\lambda}} \qquad (11)$$

where $p = 1,2,\ldots, 2n-1$; λ being an arbitrary number between $\frac{1}{2}$ and $\frac{1}{2} + \frac{1}{2n}$, and either

$$\varkappa_j = iik(\theta_1^{\frac{2n}{2n-1}} + \theta_2^{\frac{2n}{2n-1}})^{-\frac{1}{2n}}\,\theta_j^{\frac{1}{2n-1}} \text{ or } \varkappa_j = -ik\,(\theta_1^{\frac{2n}{2n-1}} +$$

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$$+ \theta_2^{\frac{2n}{2n-1}})^{-\frac{1}{2n}} \theta_j^{\frac{1}{2n-1}}, \quad j = 1,2.$$

The author mentions: J. N. Vekua, B. P. Paneyakh and V. P. Palamodov. The author thanks P. P. Mosolov for advice.

There are 5 Soviet-bloc references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University im. M. V. Lomonosov)

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Card 6/6

VAYNBERG, B.R.

Asymptotic behavior of Green's function for Sobolev-Gal'pern equations. Dokl.AN SSSR 136 no.5:1015-1018 F '61. (MIRA 14:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom I.G.Petrovskim.
(Groups, Theory of) (Functional analysis)

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AUTHOR: Vaynberg, B.R.

TITLE: The Asymptotic Behavior of the Green's Function for Sobolev-Gal'pern Equations

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 5, pp. 1015 - 1018

TEXT: The author gives asymptotic formulas (for $|x| \to \infty$ and $t = \text{const} > 0$) for the solution (Green's function $G(x,t)$) of the Cauchy Problem for the equation

(1) $$P(\partial/\partial t,\ i\,\partial/\partial x)u = 0$$

with the initial conditions

$$G\big|_{t=0} = \partial G/\partial t\big|_{t=0} = \dots = \partial^{l-2}G/\partial t^{l-2}\big|_{t=0} = 0;\ \partial^{l-1}G/\partial t^{l-1}\big|_{t=0} = \delta(x) .$$

Here $P(\lambda, s)$ is a polynomial of two variables with constant coefficients ; $s = \sigma + i\tau$; and it is assumed that the condition

(2) $$\operatorname{Re} \lambda_j(\sigma) < c,\ j = 1,2,\dots,l$$

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The Asymptotic Behavior of the Green's Function for Sobolev-Galpern Equations

is satisfied, where $\lambda_j(s)$ are roots of the equation

(3) $$P(\lambda, s) = P_l(s)\lambda^l + P_{l-1}(s)\lambda^{l-1} + \ldots + P_0(s)\Big|_{t=0} = 0 \ .$$

At first the special case

(4) $$Q(i\,\partial/\partial x)\,\partial u/\partial t = P(i\,\partial/\partial x)u$$

is considered. The asymptotic behavior of the Green's function of (4) is determined by the behavior of the quotient $P(s)/Q(s)$ in the neighborhood of the real poles, the non-real poles, and for $|s| \to \infty$, and his three summands:

(9) $$G(x,t) \sim G_1(x,t) + G_2(x,t) + G_3(x,t) \ .$$

Here $G_2(x,t)$ is given by

(13) $$B\cdot G_2(x,t) = \sum_{j=1}^{n}\left\{ c_j |x|^{-\frac{n_j+2}{2n_j+2}} t^{\frac{1}{2n_j+2}} \exp-\left[ixs_j\left[1+O\left(|x|^{\frac{1}{n_j+1}}\right)\right]\right]\right\}$$

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where $s_j = \sigma_j + i\tau_j$ is a complex root of $Q(s) = 0$ and n_j is the multiplicity of this root (the author only considers roots for which $x\,\tau_j < 0$). The author gives several formulas for G_1 and G_2 in dependence of the series development of $P(s)/Q(s)$ at the corresponding place. Then the general case (1) is reduced to the special case (4).

Theorem 2 : For the Green's function $G(x,t)$ of (1), for $|x| \to \infty$ and $t = \text{const} > 0$ there holds the representation

$$G(x,t) \sim \sum_j G_{j_1}(x,t) + \sum_j G_{j_2}(x,t) + \sum_j G_{j_3}(x,t) \quad .$$

Here G_{j_1}, G_{j_2} and G_{j_3} depend only on the behavior of $\lambda_j(s)$ in the neighborhood of the real poles and the complex poles, and the infinitely far point, respectively.

G_{j_1} and G_{j_2} differ from the corresponding summands of the asymptotic

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The Asymptotic Behavior of the Green's Function for Sobolev-Gal'pern Equations

behavior of the Green's function of (4) by the factor

$b_{jk}\left(\frac{|x|}{|\alpha_{n_k}|t}\right)^{-\frac{\lambda_{jk}}{n_k+1}}$, G_{j_3} by the factor $a_j|x|^{\frac{\lambda_j}{n-1}}(|\alpha_n|t)^{-\frac{\lambda_j}{n-1}}$.

Here $a_j s^{\lambda_j}$ and $b_{jk} s^{\lambda_{jk}}$ are the first terms of the Puiseux expansion of $(-1)^n/\prod_{k\neq j}\left[\lambda_k(s)-\lambda_j(s)\right]$ in the neighborhood of the infinitely far point and the poles, respectively.

Theorem 3 : The asymptotic behavior of the derivatives of the Green's function of (1) is obtained by differentiation of the asymptotic of $G(t,x)$.

Classes of existence of the solution of the Cauchy problem for (1) are obtained from the obtained formulas.

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The Asymptotic Behavior of the Green's Function for Sobolev-Gal'pern Equations

The author mentions S.L. Sobolev, S.A. Gal'pern, A.G. Kostyuchenko, G.I. Eskin, I.M. Gel'fand and G.Ye. Shilov. He thanks M.V. Fedoryuk for aid.

There are 6 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

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Card 5/5

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(Differential equations, Partial)

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(ENDOCRINE GLANDS--INNERVATION)

ACCESSION NR: AT4039429 S/2879/64/000/000/0301/0308

AUTHOR: Vaynberg, D. V. (Kiev); Sinyavskiy, A. L. (Kiev); Dekhtyaryuk, Ye. S. (Kiev)

TITLE: Iteration algorithms and digital problems in the theory of plates and shells

SOURCE: Vsesoyuznaya konferentsiya po teorii obolochek i plastin. 4th, Yerevan, 1962. Teoriya obolochek i plastin (Theory of plates and films); trudy* konferentsii, 1964, 301-308

TOPIC TAGS: shell, plate, computer, digital computer, descent method, digital problem, iteration algorithm, programming, elasticity theory, Dirichlet problem

ABSTRACT: With the development of computer engineering, the way has been opened for new solutions to problems in the theory of elasticity. The construction of an algorithm for this purpose on an automatic digital computer, however, requires more than the knowledge of a method for solving the problem, capable of being carried out by man; it is necessary for additional logical steps to be carried out in order to attain complete formalization of all stages of the problem-solving process. In this article, the authors consider the construction of an algorithm for the digital solution of a large class of discrete equation systems in elasticity theory. The algorithm is designed to make an effective use of the

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ACCESSION NR: AT4039429

capabilities of modern automatic digital computers. Methods of solution are chosen so that the equations themselves undergo no transformations during the computation process. Each individual equation is not stored in the memory of the machine, but is automatically derived each time its use is required. From this point of view, iteration methods are the most suitable and most natural mode of operation with automatic digital computers. By this iteration method, a program has been developed which permits the handling, with no essential modifications, of an extensive class of problems differing in the type of equations, the configuration of the region, the character of the boundary conditions and other fundamental or initial parameters. The program makes an economical use of the internal memory of the machine, with input and output information presented in compact form. On the basis of a detailed structural study of the algorithm, the program has been broken down into blocks, each of which performs a specific function. A set, therefore, of these standardized blocks should facilitate the construction of a program for an entire cycle of related problems. The program given in the article is based on a class of iteration algorithms called descent methods. The essence of the method is explained in the article in geometrical language and is shown to be a method of conjugate gradients which is very effective in the solution of a number of problems. In the second section of the paper, the actual

ACCESSION NR: AT4039429

program itself is described. Its distinguishing feature is the fact that the structure of the equations, the form of the grid region and the type of boundary conditions do not form part of the program itself, but are fed into the machine in the form of basic information. The program was used to make torsion calculations for a group of shapes and for the solution of a Dirichlet problem for a 625-node grid. In addition, computations were made for a plate with a load in the form of a concentrated transverse force with a grid containing 100 nodes. Iteration calculations were carried out for a cylindrical panel and for several other related engineering problems. The algorithms and programs described in the article also apply to three-dimensional problems in elasticity theory and to nonlinear problems, where they are particularly effective. Orig. art. has: 14 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 14May64 ENCL: 00

SUB CODE: AS, DP NO REF SOV: 001 OTHER: 000

Card 3/3

VAYNBERG, D.V.

Beam of great curvature on an elastic basis. Dop.AN URSR no.2:34-39 '48. (MIRA 9:9)

1.Predstavleno diysnim chlenom AN URSR M.M.Davidenkovym.
(Girders) (Deformations (Mechanics))

VAYNBERG, D.V.

Local stresses in a plane ring and transition to an infinite bar.
Dop.AN URSR no.3:34-40 '48. (MLRA 9:9)

1. Institut budivel'noi mekhaniki Akademii nauk Ukrain'koi RSR.
Predstavleno diysnim chlenom AN URSR S.V.Serensenom.
(Strains and stresses)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R001859110012-3"

VAYNBERG, D. V.

Verbatim: Vaynberg, D. V. - "On calculating the stability of systems with cyclic symmentry," Doklady Akad. nauk Ukr. SSR, No. 6, 1948, p. 16-20, (In Ukranian, resume in Russian)

SO: U-4355, 14 August 53, (Letopis 'zhurnal 'nykh Statey, No. 15, 1949.)

VAYNBERG, D. V.

Vaynberg, D. V. "Compressi^n of a disk with rim b y means of centripetal forces," Sbornik trudov (Kiyevsk. inzh.-stroit, in-t), Issue 8, 1948, p. 99-114

SO: U-3850, 16 June 53, (Letopis 'Zhurnal 'nykh Statey, No. 5, 1949).

VAYNBERG, D. V.

Vaynberg, D. V. - "The problem of the natural significance of a circular ring in a linear-flexible medium", Sbornik trudov In-ta stroit. mekhaniki (Akad. nauk Ukr. SSR), Vol. X, 1948, (In index: 1949), p. 175-92.

SO: U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).

VAYNBERG, D.V.

[redacted]

Generalized biharmonic problem in the theory of elasticity. Dop.AN URSR no.1:27-32 '49. (MLRA 9:9)

1.Institut budivel'noi mekhaniki AN URSR. Predstaviv diysniy chlen AN URSR F.P.Belyankin.
(Elasticity)

VAYNBERG, D.V.

Contact problem for the bending of plates. Dop.AN URSR no.1:33-38 '49. (MLRA 9:9)

1.Institut budivel'noi mekhaniki AN URSR. Predstaviv diysniy chlen AN URSR F.P.Belyankin.
(Elastic plates and shells)

VAYNBERG, D. V.

Vaynberg, D. V. "On a certain class of contact problems in the applied theory of elasticity," Infrom. materialy (Akad. nauk Ukr. SSR, In-t stroit. mekhaniki), No. 1, 1949, p. 55-70, - Bibliog: 6 items.

So: U-3736, 21 May 53, (Letopis 'Zhurnal 'nykh Statey, No. 17, 1949).

VAYNBERG, D. B.

26315 Kolebaniye i ustoychivost' arok, podderzhivayemykh uprugpmn svyazyami. Sobrnik trudov in-ta stroit. Mekhaniki (akad. nauk ukr. SSR), No. 11, 1949 s. 32-42.

SO: LETOPIS' NO. 35, 1949

VAYNBERG, D.V.

Source: Mathematical Reviews, Vol No.

VAYNBERH, D.V.; BYELYANKIN, F.P., diysnyy chlen.

Relationship between the problem of plane deformation of a ring reinforcing a plate and the classical theory of bending circular disks and "long" bars on a linear pliable base. Dop.AN URSR no.3:219-222 '51. (MLRA 6:9)

1. Akademiya nauk Ukrayins'koyi RSR (for Byelyankin). 2. Instytut budivel'noyi mekhaniky Akademiyi nauk Ukrayins'koyi RSR (for Vaynberh).
(Elastic solids)

VAYNBERH, D.V.; BELYANKIN, F.P., diysnyy chlen.

Relationship between methods based on the elasticity theory and the resistance of materials theory in certain contact biharmonic problems under the action of concentrated forces. Dop.AN URSR no.4:270-273 '51. (MIRA 6:9)

1. Akademiya nauk Ukrayins'koyi RSR (for Belyankin). 2. Instytut budivel'noyi mekhaniky Akademiyi nauk Ukrayins'koyi RSR (for Vaynberh).
(Strains and stresses)

VAYNBERH, D.V.; BELYANKIN, F.P., diysnyy chlen.

Construction of a partial integral of a heterogenous biharmonic equation of bend in plates under concentrated forces and moments. Dop.AN URSR no.4:274-276 '51. (MLRA 6:9)

1. Akademiya nauk Ukrayins'koyi RSR (for Belyankin). 2. Instytut budivel'noyi mekhaniky Akademiyi nauk Ukrayins'koyi RSR (for Vaynberh).
(Strains and stresses)

VAYNBERH, D.V.; BYELYANKIN, F.P., diysnyy chlen.

Plane ring disks and continuous long beams on an elastic base. Dop.AN URSR no.5:353-357 '51. (MLRA 6:9)

1. Akademiya nauk Ukrayins'koyi RSR (for Byelyankin). 2. Instytut budivel'-noyi mekhaniky Akademiyi nauk Ukrayins'koyi RSR (for Vaynberh).

(Elasticity)

VAYNBERG, D. V.

USSR/Physics - Elasticity 11 Oct 51

"Computing Composite Disks and Plates Under the Action of Concentrated Forces," D. V. Vaynberg, Inst of Structural Mech, Acad Sci Ukrainian SSR, Kiev

"Dok Ak Nauk SSSR" Vol LXXX, No 5, pp 721-724

Discusses the solns of the problems concerning the planar deformation or bend in composite ring plates under the action of concd forces, and also the case of a disk, compressed by 2 concd forces, with a rim of different materials. Tabulates results of computations according to various methods (asymptotic summation, direct summation of trigonometric series). Submitted 13 Aug 51 by Acad A. I. Nekrasov.

221T89

USSR/Physics - Elasticity (Disks) 21 Oct 51

"Method of Discrete Bonds in the Biharmonic Contact Problem for Elastic Bodies With Circular Symmetry," D. V. Vaynberg, Inst of Const Mech, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXX, No 6, pp 865, 866

Considers an approx method for solving the problem of the planar deformation and bend in plates consisting of touching concentric sections of different stiffness under the action, on the contour, of concd

21TT91

forces and moments. Usual methods have led to slowly converging series for the soln, especially in those cases where the circular sections are narrow and the stiffness varies sharply from one zone to another. Submitted 10 Jul 51 by Acad A. I. Nekrasov.

21TT91

VAYNBERG, D. V.

DRANISHNIKOV, P.I.; MINTSKOVSKIY, M.SH.; VAYNBERG, D.V., doktor tekhnicheskikh nauk, redaktor; TUROVSKIY, B., redaktor; GARSHANOV, A., tekhnicheskiy redaktor

[Constructing buildings over mines; with V-shaped foundations] Stroitel'stvo zdanii nad gornymi vyrabotkami; na klinovidnykh fundamentakh. Pod red. D.V.Vainberga. Kiev, Izd-vo Akademii arkhitektury USSR, 1952. 132 p. (MLRA 9:8)
(Building) (Foundations)

VAYNBERG, D.V., doktor tekhnicheskikh nauk; BELYANKIN, F.P., otvetstvennyy redaktor; SOKOLOVSKIY, L.I., redaktor; BAKHLINA, N.P., tekhnicheskiy redaktor; MUSHIK, N.I., tekhnicheskiy redaktor;

[Tension in composite disks and plates] Napriazhennoe sostoianie sostavnykh diskov i plastin. Otvetstvennyi redaktor F.P.Beliankin. Kiev, Izd-vo Akademii nauk Ukrainskoi SSR, 1952. 419 p. (MIRA 8:2)

1. Deystvitel'nyy chlen AN Ukrainskoy SSR.
(Elastic plates and shells) (Strength of materials)

VAYNBERH, D.V.; BELYANKIN, F.P., diysnyy chlen.

Stress in a circular plate revolving around its diameter. Dop.AN URSR no.4: 330-333 '52. (MLRA 6:10)

1. Akademiya nauk Ukrayins'koyi RSR (for Belyankin). 2. Instytut budivel'noyi mekhaniky Akademiyi nauk Ukrayins'koyi RSR (for Vaynberh).

(Disks, Rotating)

VAYNBERG, D. V.

PA 241T71

USSR/Mathematics - Elasticity

Nov/Dec 52

"The Analogy Between Problems on the Two-Dimensional Stressed State and on the Flexure of a Circular Plate of Variable Thickness Under Asymmetric Load," D. V. Vaynberg, Kiev, Inst of Construction Mech, Acad Sci Ukr SSR

"Priklad Matemat i Mekhan" Vol 16, No 6, pp 749-752

Shows that the eq of flexure of a circular plate of variable thickness and the eq for the function of stresses in the case of two-dimensional deformation for any load can be written in the form of one generalized eq, whose soln gives the solns of both at the same time. Submitted 22 Jan 52.

241T71

1. VAYNBERG, D. V.

2. USSR (600)

4. Disks, Rotating

7. Experimental study of the tensile condition of dish wheels. Vest. mash. 32 no.10 1952.

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

VAYNBERG, D. V.

PISARENKO, G.S.; VAYNBERG, D.V.; POPKOV, V.G., kandidat tekhnicheskikh nauk, redaktor.

[Mechanical vibrations] Mekhanicheskie kolebaniia. Kiev, Gos. izd-vo tekhn. lit-ry USSR., 1953. 139 p. (MLRA 7:8)
(Vibration)

VAYNBERG, D.V.

Deformations of bevel gear wheels. Dop.AN URSR no.6:442-445 '53.
(MLRA 7:1)

1. Institut budivel'noi mekhaniki Akademii nauk Ukrains'koi RSR.
Predstaviv diysniy chlen Akademii nauk Ukrains"koi RSR F.P.Belyankin.
(Deformations (Mechanics)) (Gearing, Bevel)

VAYNBERG, D.V.

Stress in a dam of parabolic profile having an aperture. Sbor. trud.Inst.stroi.mekh.AN URSR no.18:5-22 '53. (MLRA 9:8)
(Dams) (Strains and stresses)

VAYNBERG, D.V.

3583. Vainberg, D. V., **Stress concentration around a gallery in a dam (in Russian),** *Gidrotekh. Stroit.* **22,** 9, 7-10, Sept. 1953.

An approximate computation of these stresses is given for:

(a) Loading by the dam weight. An approximate method is used, in which radial stresses on the walls of the hole are computed as if the hole did not exist. These stresses are introduced in an opposite sense as an external loading on the walls around the hole, cut in an elastic infinite body. The stresses in the tangential direction on the walls around the hole are given by summarizing the stresses computed for both cases.

(b) Loading by water pressure. It is shown that the intensity of the stresses around the place of the hole is the most important factor and that the exact distribution of these stresses is only of minor importance. Therefore, the stresses in the center of the holes are computed first as if the hole did not exist. Then a homogeneous field of these stresses is investigated and the stresses around the hole are computed. For various shapes of the hole the formulas given by G. N. Savin (1951) are used.

The results of the method are demonstrated by an example and the distribution of the stresses around the hole is charted. Author states that his results agree with the results of photoelasticity measurements.

V. Mencl, Czechoslovakia

124-57-1-1230

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 1, p 168 (USSR)

AUTHORS: Vaynberg, D.V., Popkov, V.G., Umanskiy, E.S.

TITLE: Calculation of the Forces and Deformations in the Body of Tooth Gears With Arms (Raschet usiliy i deformatsiy v korpuse zubchatykh koles so spitsami)

PERIODICAL: Sb. tr. In-ta stroit. mekhan. AN UkrSSR, 1955, Nr 20, pp 5-38

ABSTRACT: The stressed state of the body of a tooth gear equipped with arms is determined. The gear is examined as a cyclically symmetrical multicontour frame. The following assumptions are made: 1) The rim of the wheel has a constant cross section and is considered as a beam with small curvature; 2) The axis of the rim, the axes of all arms, and the external loads all lie in a single plane; 3) All arms are alike and are rigidly fixed in the rim and in an absolutely rigid hub. A numerical example is given of the calculation of the body of a gear for the reduction gear of a shaft elevator; the derivation of calculation formulas is given.

Yu.P.Grigor'yev

Card 1/1 1. Gears--Design 2. Gears--Stresses --Mathematical analysis

124-57-1-1229

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 1, p 168 (USSR)

AUTHORS: Vaynberg, D.V., Popkov, V.G., Umanskiy, E.S.

TITLE: Initial Stresses in Composite Wheels (Nachal'nyye napryazheniya v sostavnykh kolesakh)

PERIODICAL: Sb. tr. In-ta stroit. mekhan. AN UkrSSR, 1955, Nr 20, pp 73-95

ABSTRACT: An approximate method for the determination of the stresses arising from the assembly of composite wheels equipped with spokes. For wheels having a sectional hub the forces exerted by the fit of the tire onto the center of the wheel and the forces resulting from the fit of the fastening rings onto the hub are determined. The formulas obtained are employed also for the calculation of the initial stresses in wheels with a solid hub. A numerical example is adduced showing the stresses in the body of a composite wheel with a cast-iron center, a steel tire, and six spokes.

1. Wheels--Stresses--Mathematical analysis

Yu.P.Grigor'yev

Card 1/1

VAYNBERG, D.V.

[redacted]

Stress condition in a welded roter with shaped indentations. Sbor. trud.Inst.stroi.mekh. AN URSR no.20:113-131 '55. (MIRA 8:7)

(Disks, Rotating) (Fans, Mechanical)

VAYNBERG, D.V.

PISARENKO, Georgiy Stepanovich, professor, doktor tekhnicheskikh nauk; SAVIN, G.N., redaktor; VAYNBERG, D.V., doktor tekhnicheskikh nauk; redaktor; KHARITONSKIY, M.B., redaktor; RAKHLINA, N.P. tekhnicheskiy redaktor.

[Vibration of elastic systems taking into account the dispersion of energy in a material] Kolebaniia uprugikh sistem s uchetom rasseianiia energii v materiale. Kiev, Izd-vo Akademii nauk Ukrainskoi SSR, 1955. 235 p. (MLRA 8:9)
(Vibration)

SOV/124-57-7-8146

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 7, p

AUTHOR: Vaynberg, D. V.

TITLE: The Action of a Load on the Contour of a Square Hole in a Plane Field (Deystviye nagruzki na kontur kvadratnogo otverstiya v ploskom pole)

PERIODICAL: V sb: Issledovaniya po vopr. ustoychivosti i prochnosti. Kiyev, AN UkrSSR, 1956, pp 75-92

ABSTRACT: The paper examines the stress distribution in a plane field created in an infinite plate with a square hole by a load distributed over a specific area on one of its sides. The problem in question is reduced to the determination of two functions of a complex variable which are determined by the method of Muskhelishvili.

A. Ya. Gorgidze

Card 1/1

GROZIN, B.D., prof., doktor tekhn.nauk; CHUDNOVSKIY, V.G., doktor tekhn.nauk, retsenzent; VAYNBERG, D.V., doktor tekhn.nauk; retsenzent; BARABASH, M., kand.tekhn.nauk, retsenzent; DRAYGOR, D.A., kand.tekhn.nauk, retsenzent; ISHCHENKO, I.I., kand.tekhn. nauk, retsenzent; HEVA, L.P., kand.tekhn.nauk, retsenzent; SALION, V.Ye., kand.tekhn.nauk, retsenzent; SHEVCHUK, V.A., kand.tekhn.nauk, retsenzent; SOROKA, M.S., red.izd-va; RUDENSKIY, Ya.V., tekhn.red.

[Studies in metallography and wear resistance of metals; collection of papers] Issledovaniia v oblasti metallovedeniia i kontaktnoi prochnosti metallov; sbornik dokladov. Pod obshchei red. B.D. Grozina. Kiev, Gos. nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1958. 127 p. (MIRA 12:1)

1. AN Ukrainskoi RSR, Kiev. Instytut budivel'noi mekhaniky.
2. Chlen-korrespondent AN Ukrainskoy SSR (for Grozin).
(Metallography) (Mechanical wear)

24(1) PHASE I BOOK EXPLOITATION SOV/1774

Vaynberg, David Veniaminovich, and Georgiy Stepanovich Pisarenko

Mekhanicheskiye kolebaniya i ikh rol' v tekhnike (Mechanical Vibrations and Their Role in Engineering) Moscow, Fizmatgiz, 1958. 231 p. 12,000 copies printed.

Ed.: S.A. Meyngard; Tech. Ed.: Ye. A. Yermakova.

PURPOSE: This book is intended for the general reader.

COVERAGE: The book describes various types of mechanical vibrations and their damaging effects and useful applications in various branches of engineering. Topics discussed are free vibrations of a pendulum and its role in the history of the development of engineering, free vibrations of elastically attached loads and of elastic bodies, forced vibrations and resonance, special types of vibrations, damaging effects of vibrations, application of vibrations in engineering, and instruments for measuring

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mechanical vibrations. The authors thank Academicians of the Academy of Sciences, UkrSSR, N.N. Davidenkov and G.N. Savin, Professor Ya. G. Panovko and V.V. Khil'chevskiy, Candidate of Technical Sciences. There are 39 Soviet references.

TABLE OF CONTENTS:

Mechanical Vibrations (Cont.) SOV/1774

AVAILABLE: Library of Congress (QA935.V25)

GO/jmr
6-22-59

VARVAK, P.M. (Kiiv); VAYNBERG, D.V. (Kiiv); CHUDNOVSKIY, V.G. [Chudnovs'kyi, V.H.] (Kiiv); GUMENYUK, V.S. [Humeniuk, V.S.] (Kiiv).

Experimental investigation of the strength of concrete blocks with apertures [in Ukrainian with summaries in Russian and English]. Prykl. mekh. 4 no.1:19-29 '58. (MIRA 11:4)

1. Institut budivel'noi mekhaniki AN URSR.
(Concrete blocks--Testing)

VAYHBERG, D.V. (Kiyev); UGODCHIKOV, A.G. [Uhodchykov, A.H] (Kiyev)

Bending stresses in tightly assembled thin plates. Prykl. mekh. 4 no.4:396-400 '58. (MIRA 11:12)

1. Institut stroitel'noy mekhaniki AN USSR.
(Elastic plates and shells)

SOV/21-59-1-6/26

25(1)

AUTHORS: Vaynberg, D.V. and Agranovich, V.M.

TITLE: On the Stressed State of Certain Multilinked Bodies (O napryazhennom sostoyanii nekotorykh mnogosvyaznykh tel)

PERIODICAL: Dopovidi Akademii nauk Ukrains'koi RSR, Nr 1, 1959, pp 21-25 (USSR)

ABSTRACT: This article deals with the plane problem of the elastic equilibrium of a circular or polygonal plate with a number of similar holes distributed, so that the region acquires a cyclic symmetry. The authors perform a series of calculations, by way of an integral equation, substituting the function of a contour's point ω (t) for the functions of Kolosov and Muskhelishvili φ (z) and ψ (z). The designations used are standard mathematical. Among them Lk (k=1,2, ,.,m) are the inner region's contours, z_{m+1} is the outer contour comprising all 5 contours under

Card 1/2

SOV/21-59-1-6/26

On the Stressed State of Certain Multilinked Bodies

considerations, L is the total region's boundary, function $f(t_o)$ is determined by the data of forces prevailing upon the contours, real numbers are b_i, Ozk is an axle, Γ_1 is upper boundary of contour L_1, Γ_2 is upper part of arc of contour L_{m+1}. The authors make references to Sherman's method, and to a method of Shvarts. They also discuss a simplified alternating method based on the position of a number of "elementary" two-linked regions formed by the outer contour and the contour of one of the holes. A diagram presents the results of the calculations of stresses of contour holes in a double-linked region, wherein R stands for disc radius and δ for disc's thickness. There are one diagram, one table, and four Soviet references.

ASSOCIATION: Institut stroitel'noy mekhaniki AN UkrSSR (Institute of Structural Mechanics of AS UkrSSR)

PRESENTED: September 29, 1958, by F.P. Belyankin, Member of AS UkrSSR

Card 2/2

ACCESSION NR: AP4006582 S/0021/63/000/004/0457/0462

AUTHOR: Vaynberg, D. V.; Itenberg, B. Z.

TITLE: Stiffened cylindrical shell under discrete forces on faces

SOURCE: AN UkrRSR. Dopovidi, no. 4, 1963, 457-462

TOPIC TAGS: stiffened cylindrical shell, stringer stiffened cylindrical shell, end stiffening ring, structurally orthotropic shell, axial face forces

ABSTRACT: The authors consider the problem of a cylindrical ribbed shell, the end face of which is reinforced with a rigid ring, to which discrete froces and moments are applied, or loads distributed along various areas of the end face of the shell.

A system of basic resolving differential equations was obtained for the displacement problem on the basis of a model of a constructively orthotropic shell.

A numerical investigation of some cases was carried out.

ASSOCIATION: Ky*yivs'ky*y Inzhenerno-Budivel'ny*y Insty*tut (Kiev Construction Engineering Institute)

SUBMITTED: 16Apr61 DATE ACQ: 03May63 ENCL: 00

SUB CODE: AP NO REF SOV: 002 OTHER: 000

Card 1/1

VAYNBERG, David Veniaminovich; CHUDNOVSKIY, Vol'f Grigor'yevich; SHRYGINA, E., red.

[Design of space frames] Raschet prostrantsvennykh ram. Kiev, Gosstroiizdat USSR, 1964. 307 p. (MIRA 17:8)

L 10793-66 EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWP(k)/EWA(h)/ETC(m) IJP(c) WW/EM/GS

ACC NR: AT6001080 SOURCE CODE: UR/0000/65/000/000/0023/0033

44,55 44,55 44,55 44,55
AUTHORS: Vaynberg, D. V.; Gerashchenko, V. M.; Roytfarb, I. Z.; Sinyavskiy, A. L. 55

44,55
ORG: Kiev Structural Engineering Institute (Kiyevskiy inzhenerno-stroitel'nyy institut) 54

B+1

26
TITLE: A summary of network equations of plate deflection by the variational method

SOURCE: Soprotivleniye materialov i teoriya sooruzheniy (Strength of materials and the theory of structures), no. 1. Kiev, Izd-vo Budivel'nyk, 1965, 23-33

TOPIC TAGS: stress analysis, thin plate, structural analysis, network structural analysis, finite difference method

16,44,55 26
ABSTRACT: A method of applying network equations for plate deflection problems is developed. A thin plate, such as that shown in Fig. 1, is considered.

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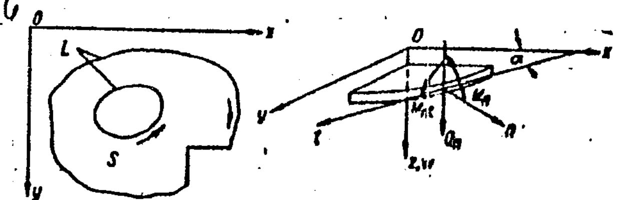

Fig. 1.

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ACC NR: AT6001080

The plate occupies the domain S bounded by the curve L consisting of

$$L_j=[l_j,\ l_{j+1}]\quad (j=1,\ 2,\ \ldots,\ m,)$$
$$l_{m+1}=l_1.$$

The potential energy of the plate is given as

$$\Pi=V-A,$$

where V is the energy of elastic deformation (elastic potential) and A is the work of external edge and surface forces. Green's formula is applied to the elastic potential to yield

$$V=\frac{D}{2}\left\{\iint\limits_S w\,\Delta\Delta\,w\,dx\,dy+\sum_{j=1}^{m}\oint\limits_{L_j}\left[(1-\nu)\left(\frac{\partial^2 w}{\partial x^2}\cos^2\alpha+\right.\right.\right.$$
$$\left.\left.+2\frac{\partial^2 w}{\partial x\,\partial y}\sin\alpha\cos\alpha+\frac{\partial^2 w}{\partial y^2}\sin^2\alpha\right)+\nu\Delta w\right]\frac{\partial w}{\partial n}\,dl+$$
$$+\sum_{j=1}^{m}\oint\limits_{L_j}\left\{(1-\nu)\frac{\partial}{\partial l}\left[\left(\frac{\partial^2 w}{\partial x^2}-\frac{\partial^2 w}{\partial y^2}\right)\sin\alpha\cos\alpha-\right.\right.$$
$$\left.-\frac{\partial^2 w}{\partial x\,\partial y}(\cos^2\alpha-\sin^2\alpha)\right]-\left(\frac{\partial^3 w}{\partial x^3}+\frac{\partial^3 w}{\partial x\,\partial y^2}\right)\cos\alpha-\left(\frac{\partial^3 w}{\partial y^3}+\right.$$
$$\left.\left.+\frac{\partial^3 w}{\partial x^2\,\partial y}\right)\sin\alpha\right\}w\,dl+(1-\nu)\sum_{j=1}^{m}\left[\left(\frac{\partial^2 w}{\partial y^2}-\frac{\partial^2 w}{\partial x^2}\right)\sin\alpha\cos\alpha+\right.$$

Card 2/4

$$+\frac{\partial^2 w}{\partial x\,\partial y}(\cos^2\alpha-\sin^2\alpha)\Big]w\Big|_{l=l_j}^{l=l_{j+1}}\Big\},$$

and the work of external forces is

$$A=\iint_S qw\,dx\,dy-\sum_{j=1}^{m}\oint_{L_j}M_n\frac{\partial w}{\partial n}\,dl+$$

$$+\sum_{j=1}^{m}\oint_{L_j}\left(Q_n-\frac{\partial M_{nt}}{\partial l}\right)w\,dl+\sum_{j=1}^{m}M_{nt}w\Big|_{l=l_j}^{l=l_{j+1}}.$$

The network system is applied to the plate as is indicated in Figures 2 and 3,

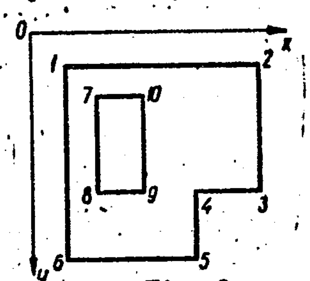

Fig. 2

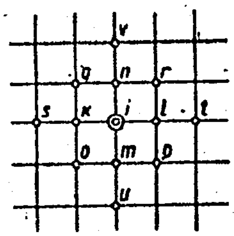

Fig. 3

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where straight line segments $L_j^{(1)}$ are perpendicular to the x-axis and segments $L_j^{(2)}$ are perpendicular to the y-axis. The ensuing quadratic network is used for substituting summation by the rectangular formula into the integral terms of the given energy expression. Differential substitutions are accomplished by computation of central differences. The authors develop and illustrate the mechanics of defining and evaluating the summation terms. The method presented was applied to the formulation of systems of difference equations for plates of variable stiffness, anisotropic plates, contact problems, and shells. The results of the applications are to be published in subsequent articles. Orig. art. has: 10 figures and 8 equations.

SUB CODE: 20/ SUBM DATE: 14May65/ ORIG REF: 002

Card 4/4

VAYNBERG, David Veniaminovich; PISARENKO, Georgiy Stepanovich; KREMENTULO, V.V., red.

[Mechanical vibrations and their role in technology] Mekhanicheskie kolebaniia i ikh rol' v tekhnike. Izd.2., perer. i dop. Moskva, Nauka, 1965. 275 p. (MIRA 18:7)

VAYNBERG, David Veniaminovich; PISARENKO, Georgiy Stepanovich;
KREMENTULO, V.V., red.

[Mechanical vibrations and their role in engineering]
Mekhanicheskie kolebaniia i ikh rol' v tekhnike. Moskva,
Nauka, 1965. 275 p. (MIRA 18:8)

VAYNBERG, D.V., doktor tekhn. nauk; ITENBERG, B.Z., kand. tekhn. nauk

Stressed state of multiconnected plates with regular configuration. Rasch. na prochn. no.9:133-172 '63 (MIRA 16:12)

STAVRAKI, L.N.; YEPANCHINTSEVA. I.A.; BELYANKIN, F.P., akademik, retsenzent; VAYNBERG, D.V., prof., doktor tekhn. nauk, retsenzent; SAMOYLOV, B.N., red.

[Simple theory for the calculation of rods under an extended load] Prosteishaia teoriia rascheta sterzhnei na prostranstvennuiu nagruzku; uchebnoe posobie dlia studentov. Kuibyshev, Kuibyshevskii inzhenerno-stroitel'nyi in-t im. A.I.Mikoiana, 1963. 54 p. (MIRA 17:7)

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VAYNBERG, D.V.; SINYAVSKI, A.L. (Kiev)

"The methods of numerical analysis in the theory of elasticity"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow" 29 January - 5 February 1964

VAYNBERG, D.V., doktor tekhn.nauk, prof. (Kiyev); SAZONOV, R.M., kand.-tekhn.nauk, dotsent (Kiyev); SEMENOV, P.I., kand.tekhn.nauk, dotsent (Kiyev)

Designing corrugated shells. Rasch.prostr.konstr. no.7:49-71 '62. (MIRA 15:4)

(Roofs, Shell)

S/124/62/000/005/043/048
D251/D308

10.6100

AUTHORS: Vaynberg, D.V., and Sinyavskiy, A.L.

TITLE: Approximate calculation of shells with cuts by potential theory methods

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 5, 1962, 8, abstract, 5V46 (V sb. Probl. mekhaniki sploshn. sredy M., AN SSSR, 1961, 73 - 82)

TEXT: The normal displacement w is considered of a circular cylindrical shell with an elliptic cut, loaded on the contour with tensional forces. To solve the problem, the system of differential equations of a thin inclined shell is replaced by a system consisting of two equations of equilibrium and one integral equation arising from the theorem of mutual actions. The integral representation of the displacement of a shell with a cut permits the evaluation of these displacements if the values of the other displacements on the contour of the cut are known. To find the latter displacements, it is sufficient, says the author, to solve the plane problem of the theory of elasticity for an infinite strip with a series of ellip-

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Approximate calculation of shells ... S/124/62/000/005/043/048
D251/D308

tical holes. [Abstractor's note: Complete translation].

Card 2/2

10.6000

S/124/61/000/009/028/058
D234/D303

AUTHOR: Vaynberg, D.V.

TITLE: Methods of designing round plates with ribs

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 9, 1961, 8, abstract 9 V68 (V sb. Raschet prostranstv. konstruktsiy, no. 5, M. Gosstroyizdat, 1959, 321-365)

TEXT: Methods of designing round plates reinforced by radial ribs are exposed in detail. For plates having a small number of ribs an exact solution, based on an application of the method of forces, is offered. The large amount of computing work in utilizing this method of solution is mentioned. If the number of ribs $k \geqslant 8$, simplifications are possible in the design of the plate itself which are based on neglecting the discrete character of the distribution of the reactions of the ribs. The reaction forces are supposed to be uniformly distributed on the surface of the plate. If the number of ribs is large ($k \geqslant 12$) the plate with ribs can be

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Methods of designing... S/124/61/000/009/028/058
D234/D303

considered as orthotropic in construction. Comparison of the results of calculating deflections according to a third method and experimental results for the case k = 16 is given. For cases when the centers of gravity of the rib sections are situated in the middle surface of the plate, a design based on methods of the theory of disturbances is offered. Results of design according to this method are given for k = 4 and k = 8. [Abstracter's note: Complete translation]

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